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(71) Applicant

Sang Do Kim

Mokdong Shinsajil Apt 723-403, Kokdong 926,

Yangcheon-Gu, Seoul, Republic of Korea

(72) Inventor

Sang Do Kim

(74) Agent and/or Address for Service

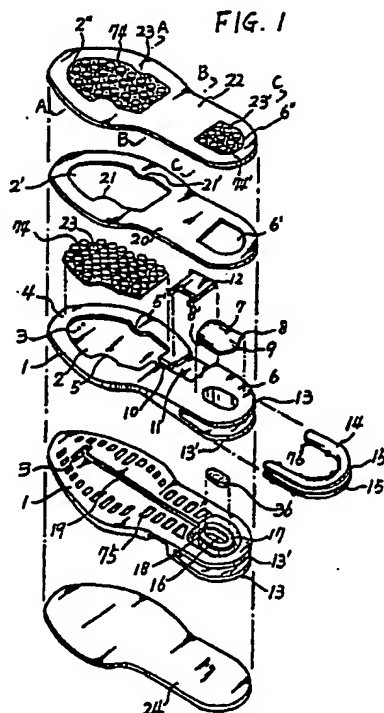
F J Cleveland & Co

40-43 Chancery Lane, London, WC2A 1JQ,

United Kingdom

(54) Ventilated footwear sole

(57) A footwear sole is disclosed which provides ventilation, shock absorption and fashion in a shoe having a flat bottom surface. The sole comprises, a mid-sole with a front part surface having an air ventilation chamber (2) and ventilation holes (3), two arc-shaped parts (21) projecting inwardly on the outskirts of the air ventilation chamber (2), a round reception chamber (6) on the rear part of the mid-sole (1) and an arc-shaped plate (7) in the round reception chamber; an air way (10) leading to a reception groove (11) disposed behind the chamber (2); a water proof and ventilation device (12) fixed in the reception groove (11); and a horseshoe-shaped shock absorbing material (14) fixed between an upper flap and a lower flap in the rear part of the mid-sole. Ventilation paths (19) and air chamber (75) are provided in the sole.



GB 2 244 200 A

16800 U.S. PTO
29/203335





FIG. 2

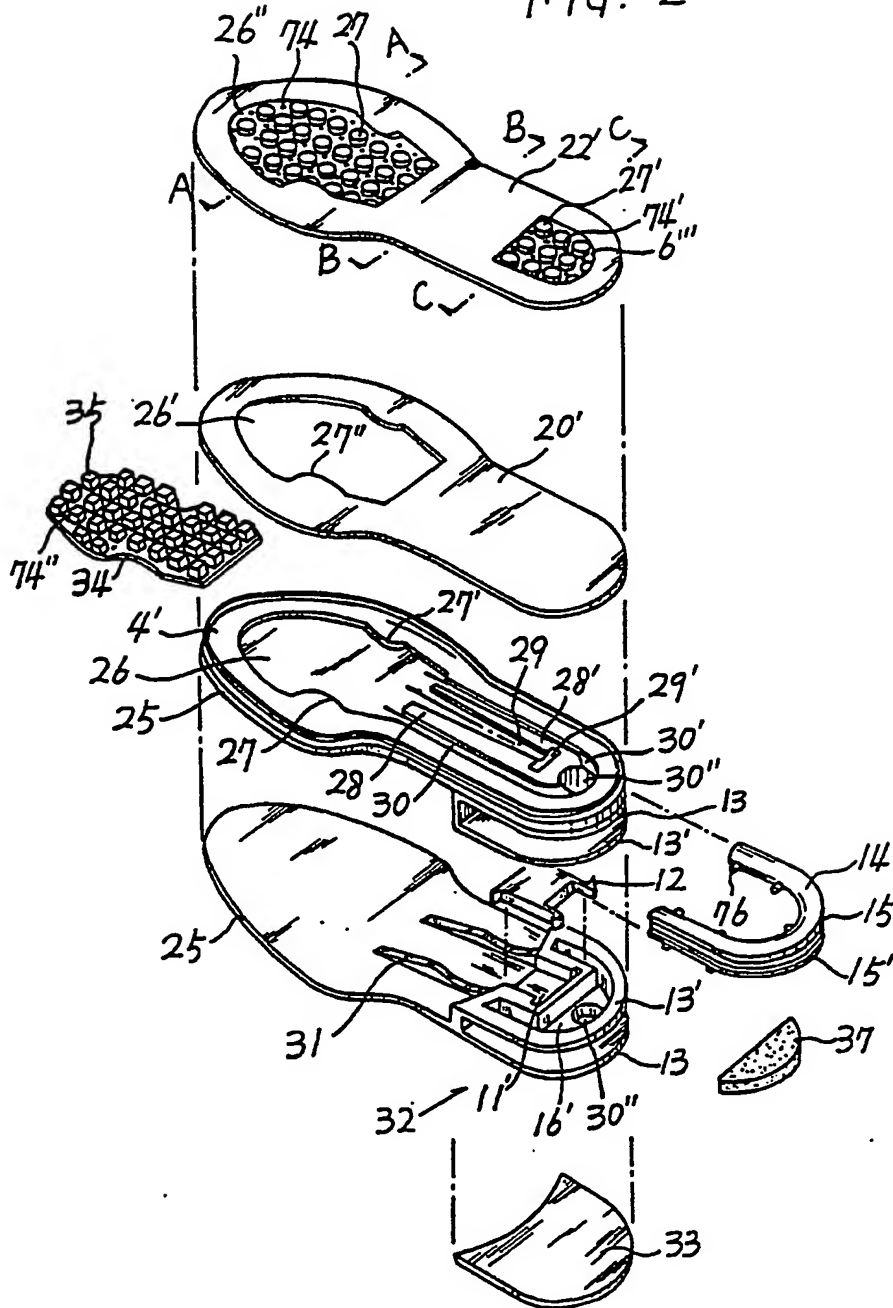




FIG. 3

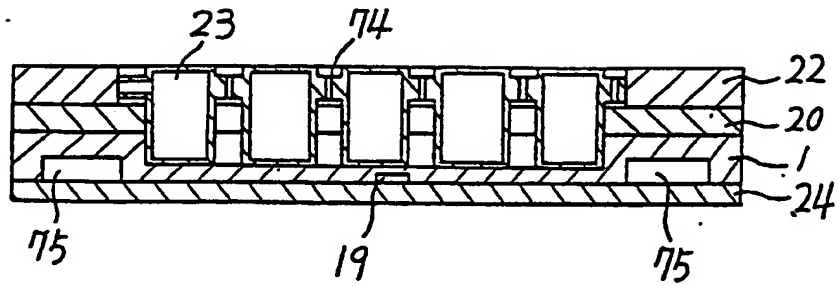


FIG. 4

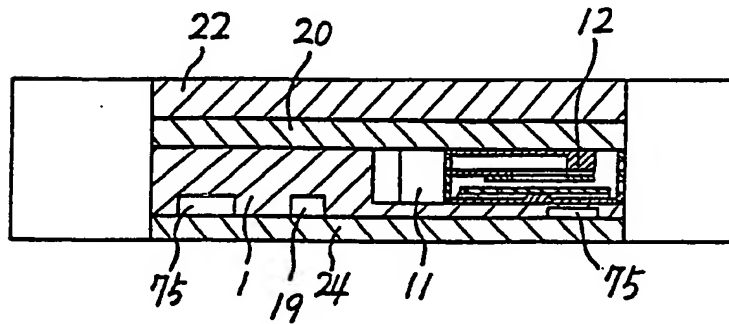
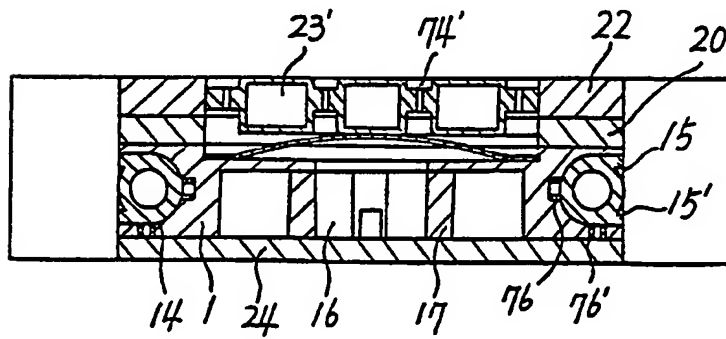


FIG. 5



4/15

16800 U.S. PTO
29/203335



FIG. 6

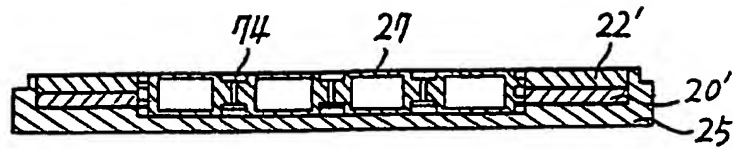


FIG. 7

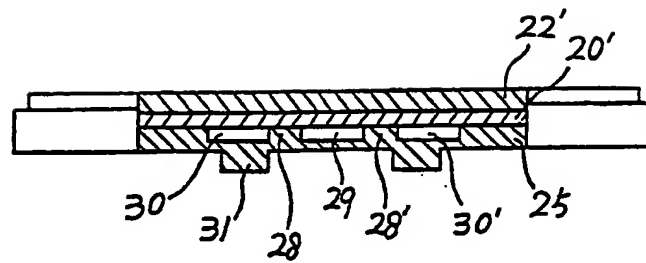
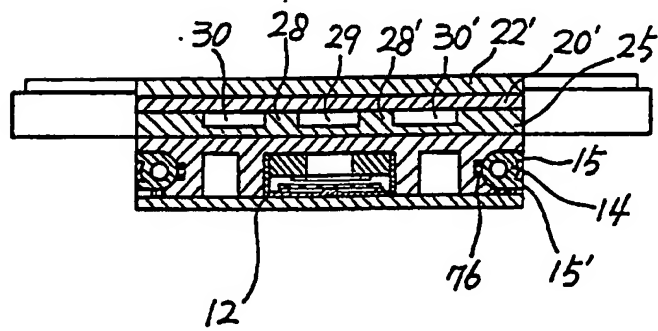


FIG. 8

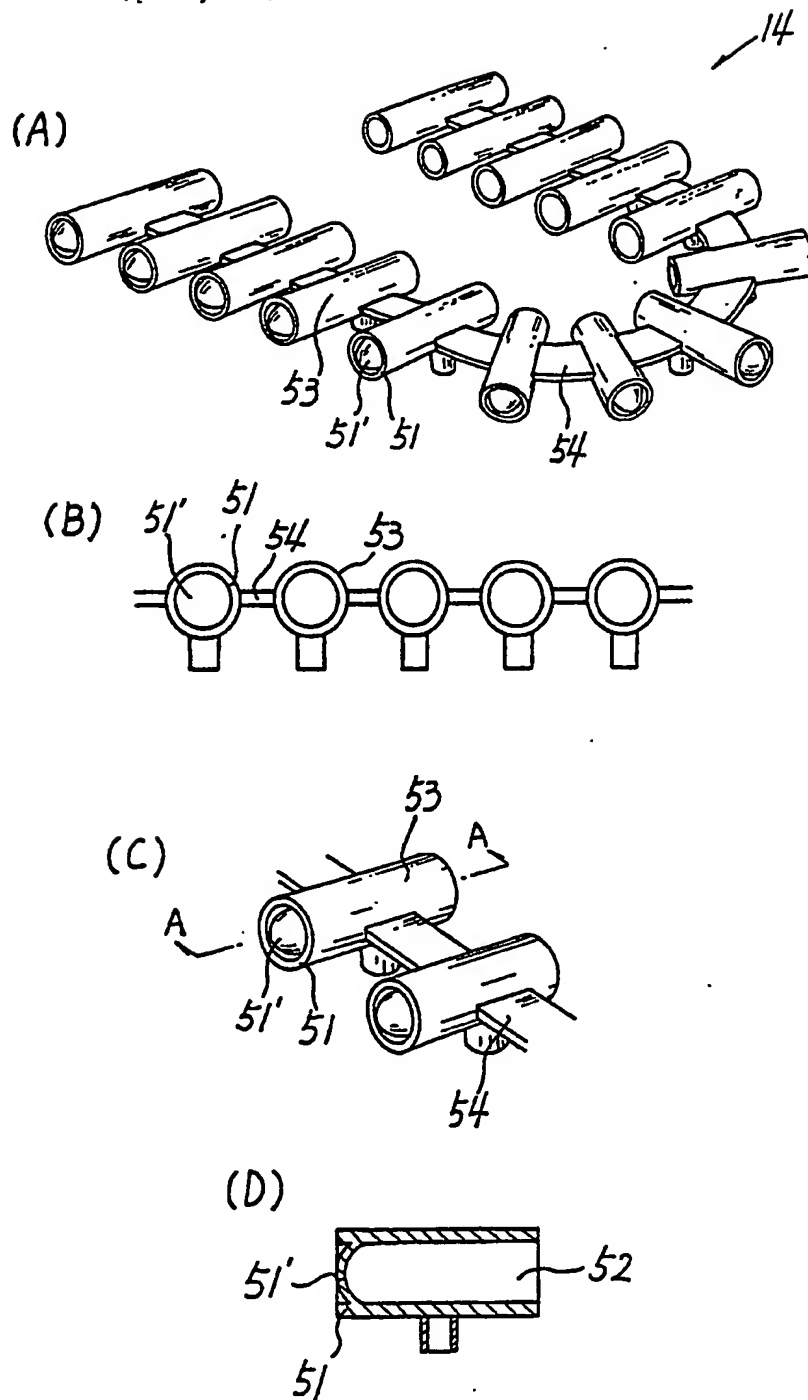


6/15

16800 U.S. PTO
29/203335



FIG. 13



7/15

16800 U.S. PTO
29/203335



FIG. 14

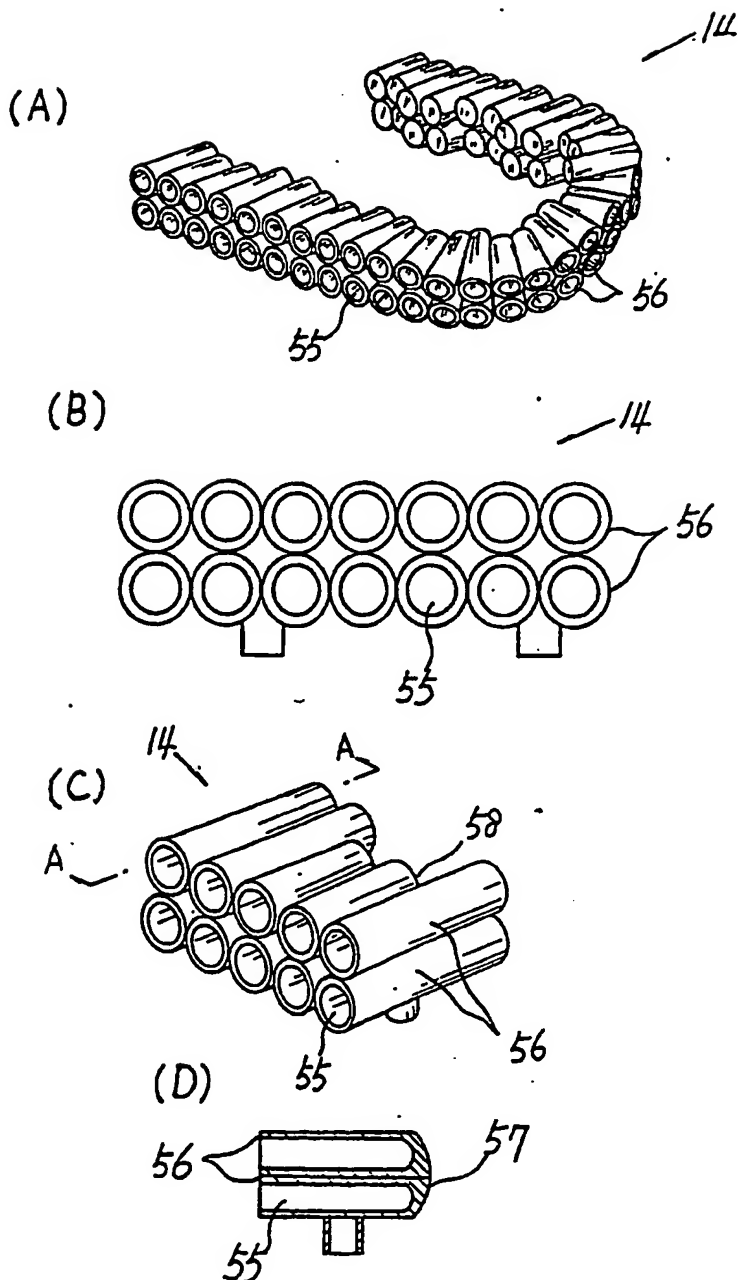
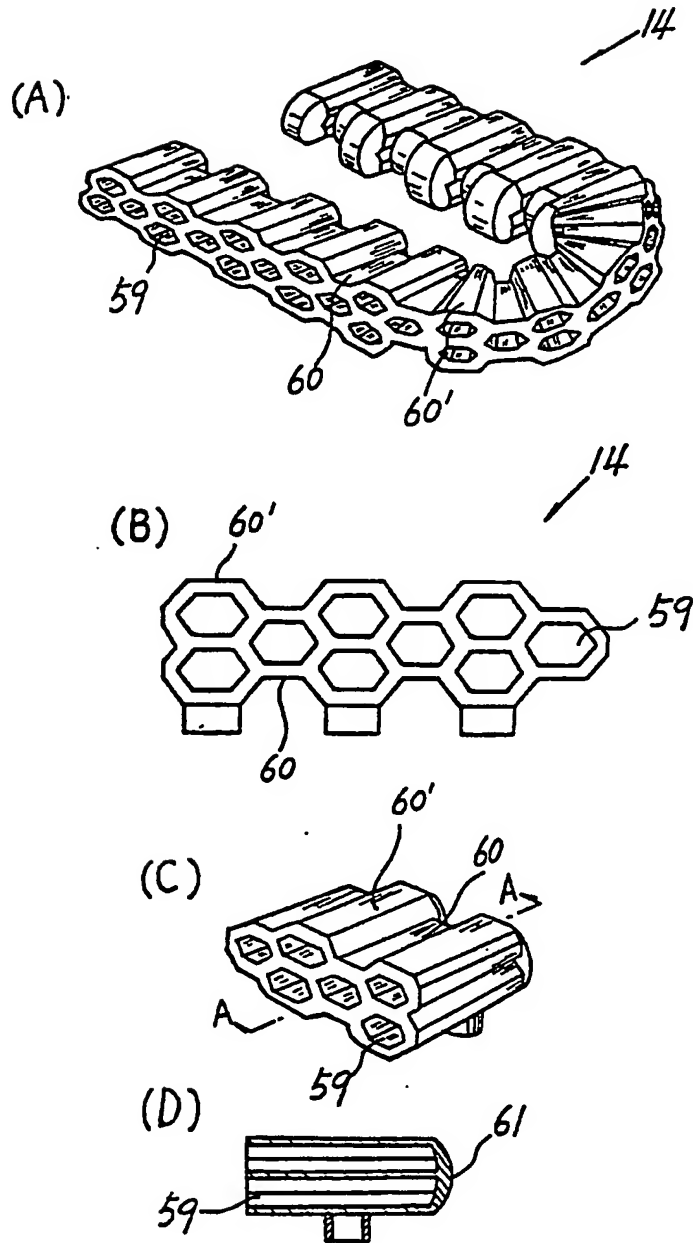




FIG. 15



9/15

16800 U.S. PTO
29/203335



FIG. 16

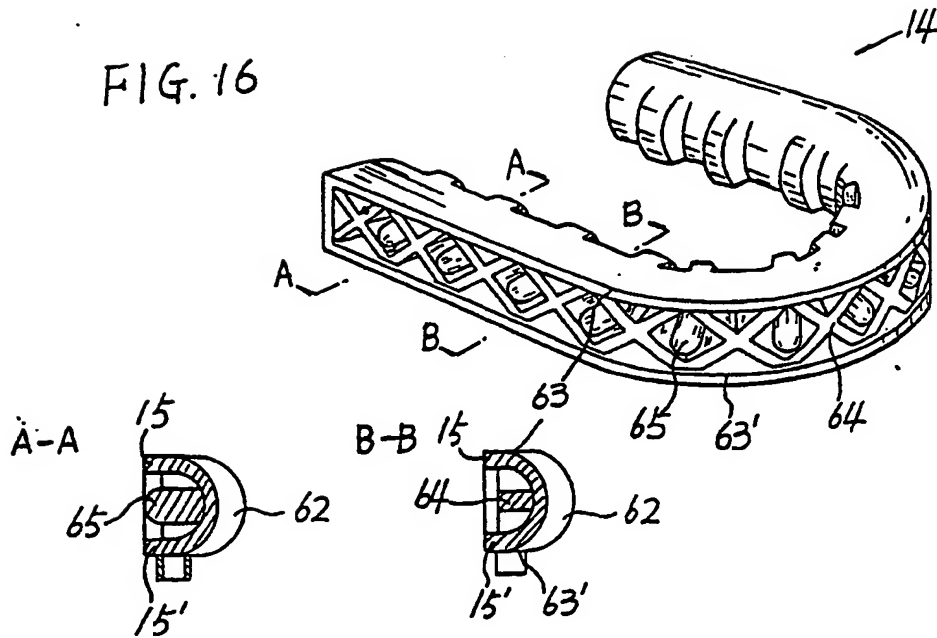


FIG. 17

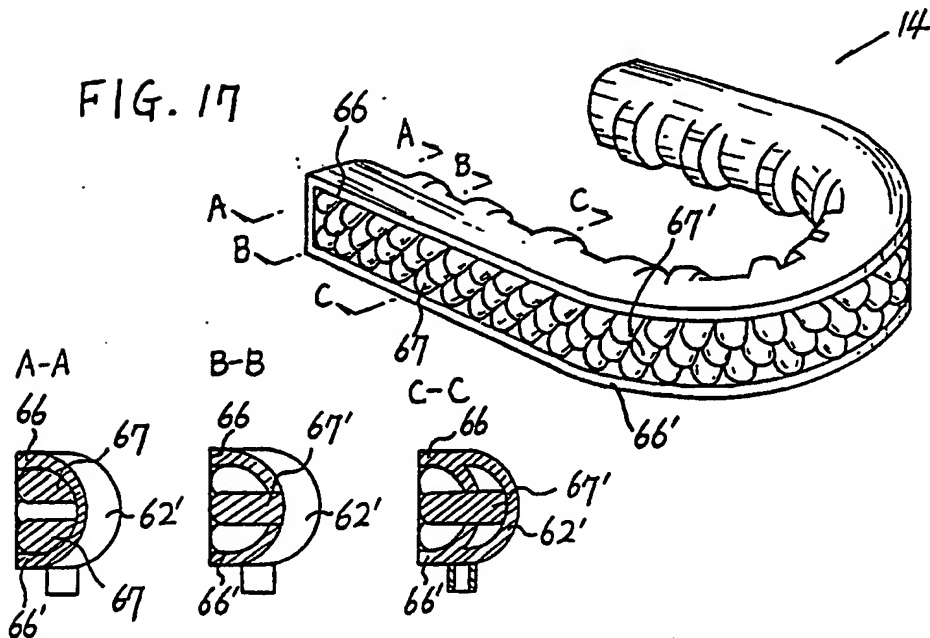




FIG. 18

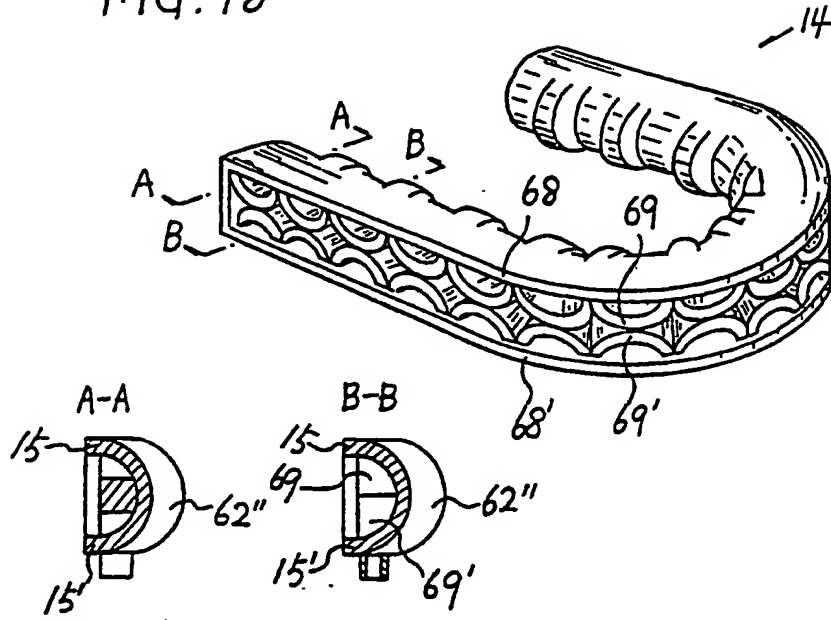


FIG. 19

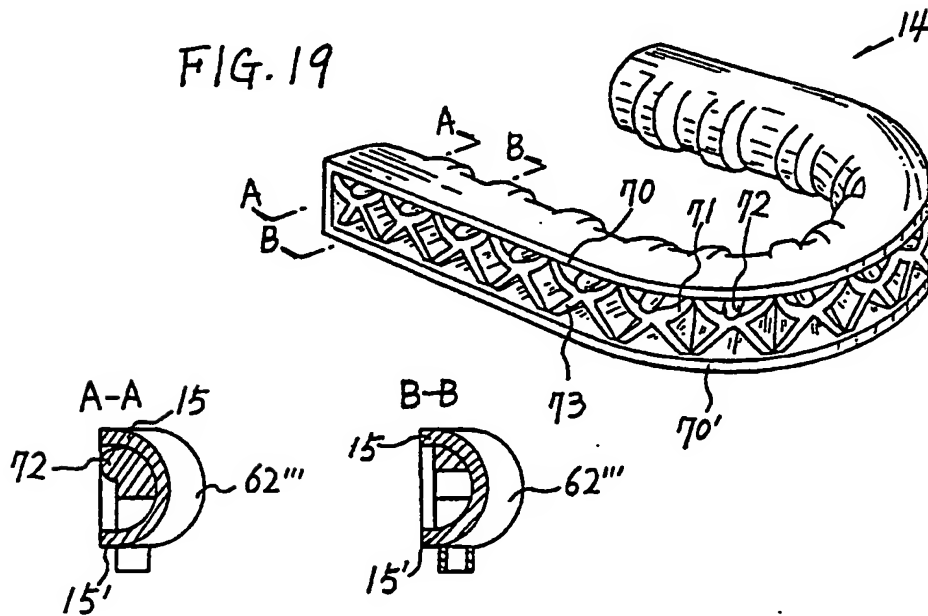
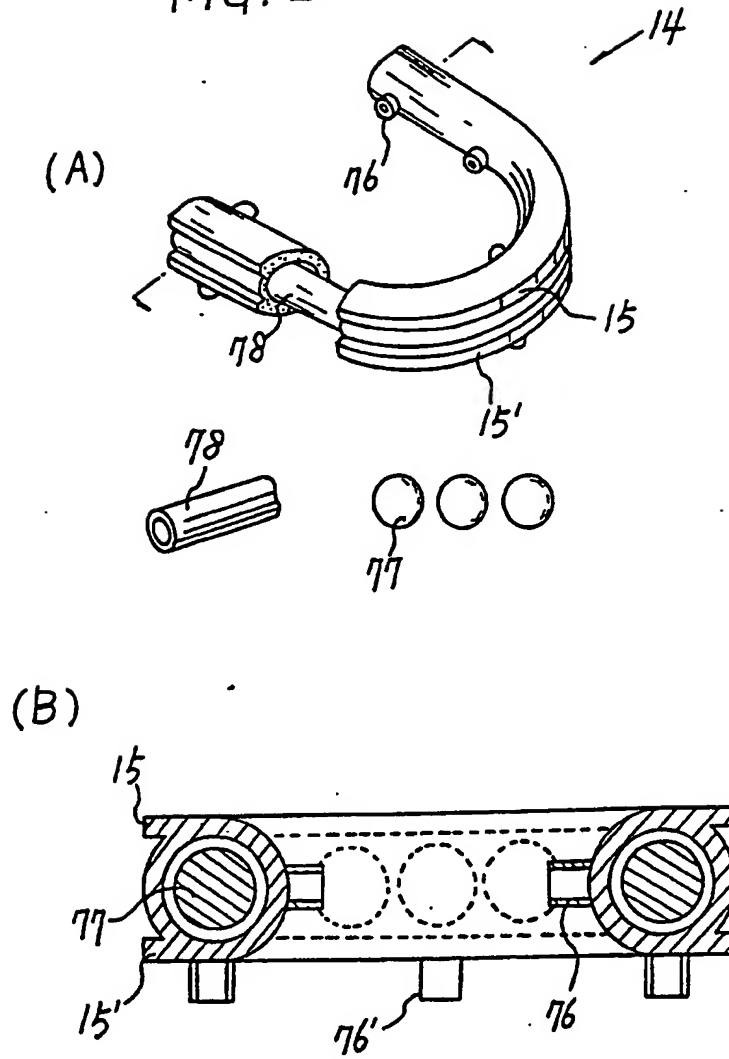


FIG. 20



12/15

16800 U.S. PTO
29/203335



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FIG. 21

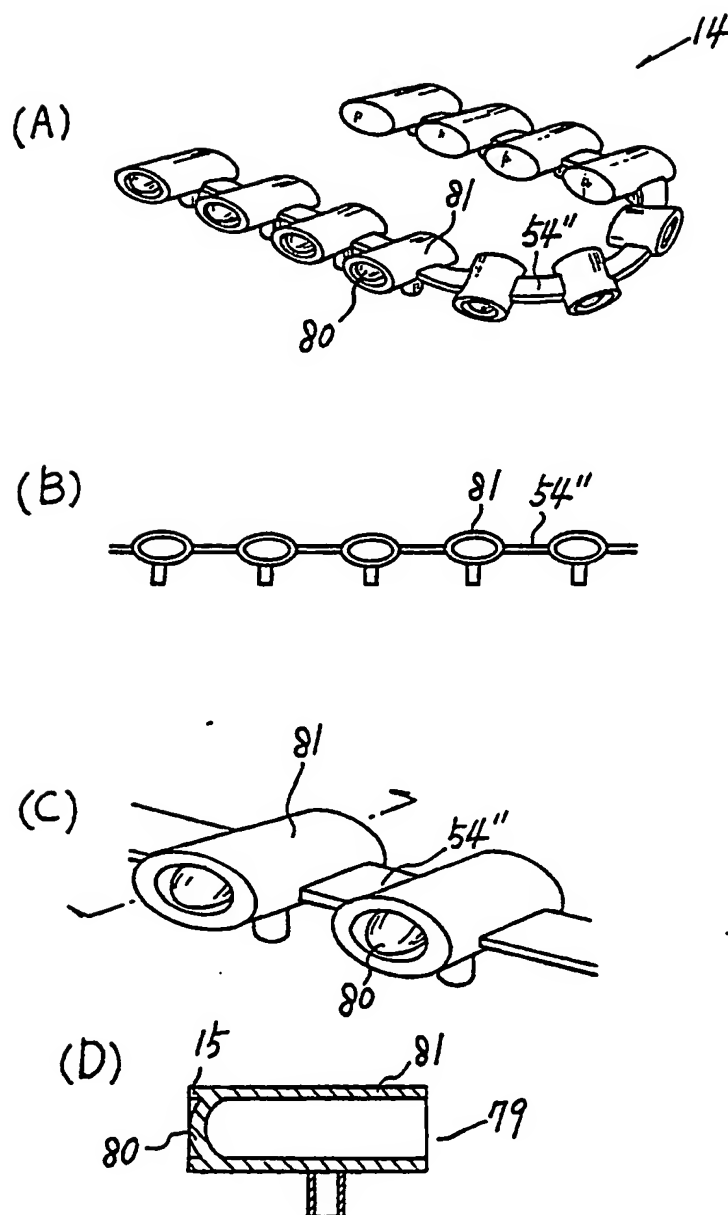




FIG. 22

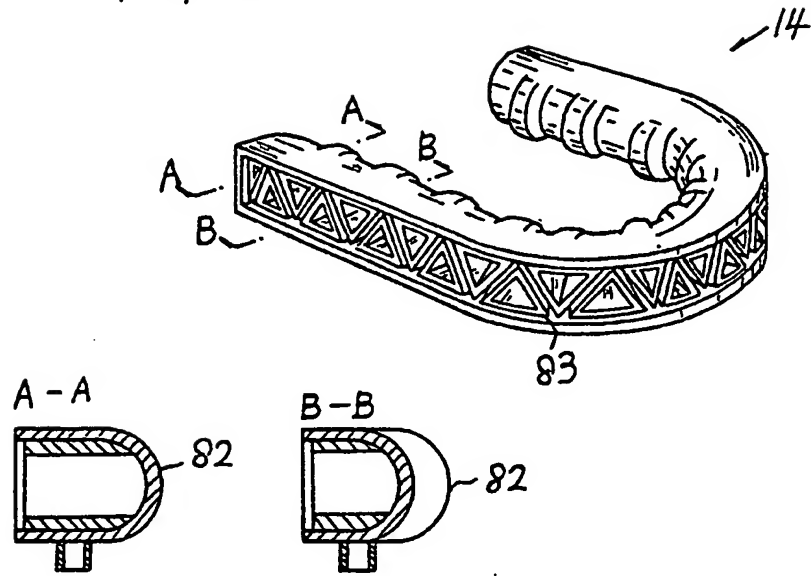


FIG. 23.

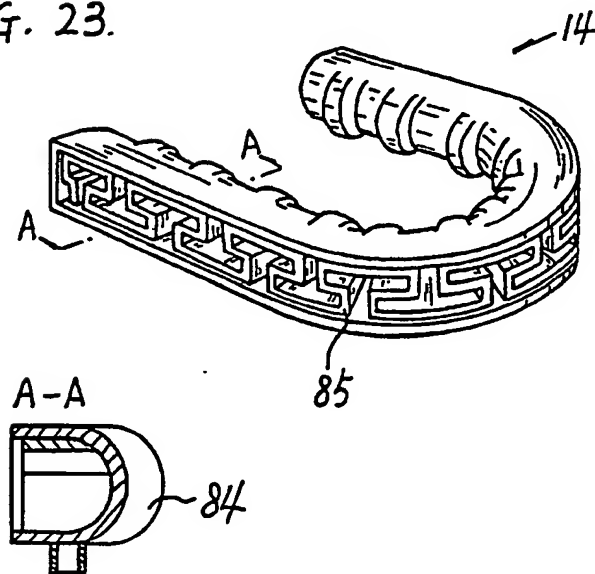
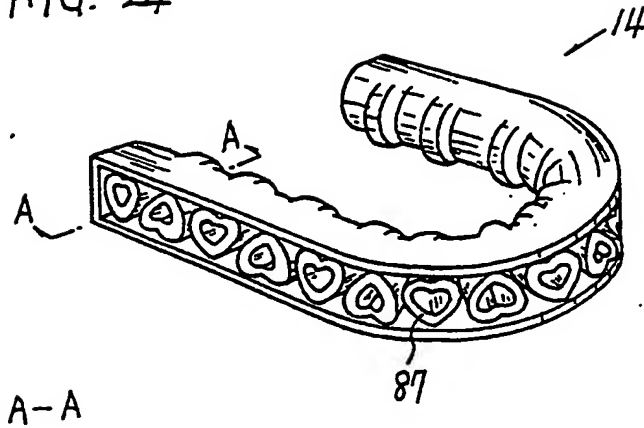




FIG. 24



A-A

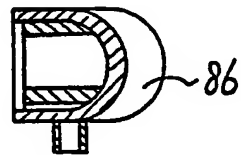
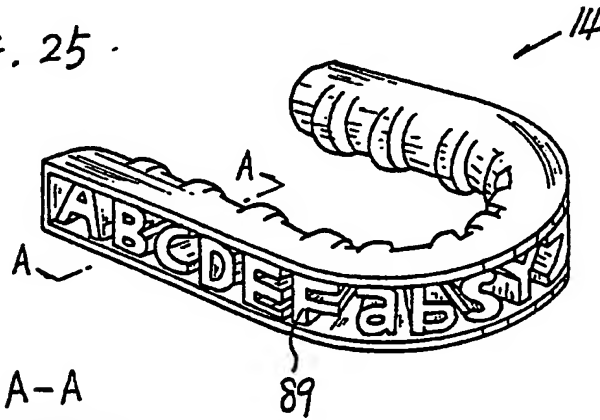


FIG. 25



A-A

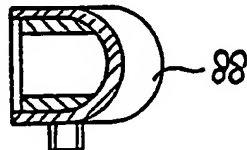
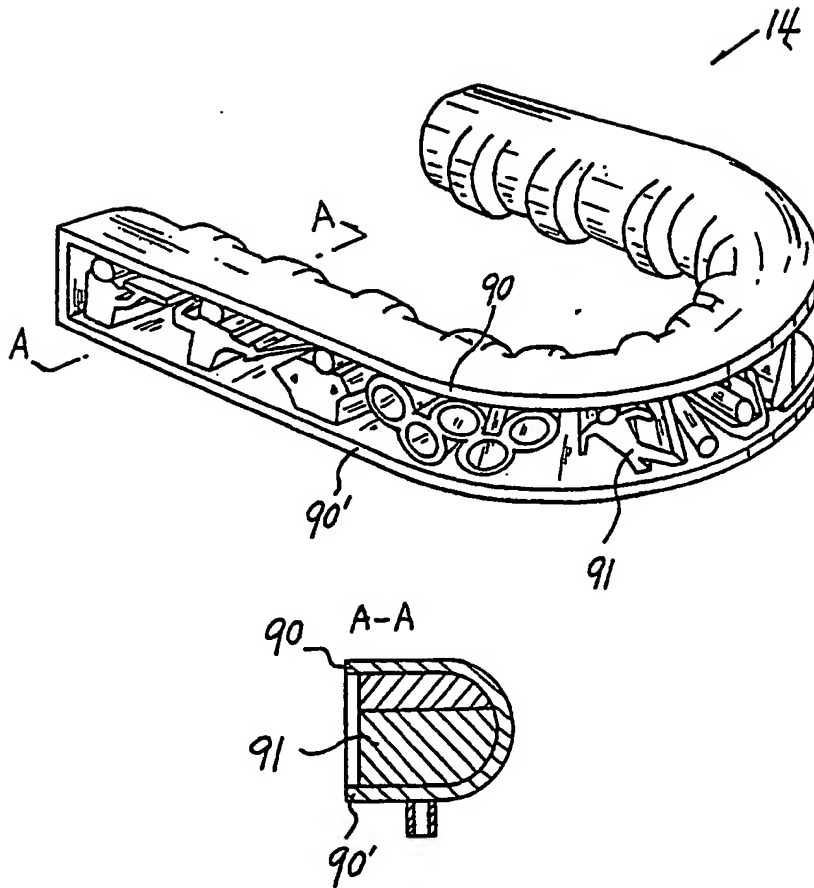




FIG. 26



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- 1 -

FOOTWEAR SOLE



The invention relates to varied footwear soles for sports footwear, shoes, military shoes, safety shoes and mountain-climbing shoes etc. that have uppers.

The invention is to provide footwear sole which can be fixed to the heel to promote cushion function and prevent water to get in the footwear in bad weather utilizing waterproof and ventilation part applied at the front of the heel, providing good ventilation and further afford shock absorption effect by means of rib applied at shank of out-sole in case of shoes, military shoes, safety shoes and mountain-climbing shoes.

Pulbication No. 82-2591 of utility patent (U.S. Patent No. 4499672, Pulbic Notice No. 80-31524 (85. 9. 20) of Japanese utility Patent) revealed a out-sole and mid-sole providing

16800 U.S.PTO
29/203335
041404

ventilation and shock absorption which was jointed to the out-sole by means of projections.

The out-sole had circular projection on its surface and the circular projections applied at the heel had some of air entry while the mid-sole projections on the outskirts of its reverse side and lots of punched ventilation holes on its innerside as well.

Publication No. 82-2592 of utility patent showed a back-sole of footwear with air entry connected to air passage way that was prepared on the heel.

Opening No. 90-2356 of utility patent also showed a footwear sole providing of ventilation and shock absorption which a ventilation cap having connective joint cap be fixed to.

Heel side part of the complemented sole having cork layer on its surface formed a circular curve part and on the reverseside of its projections for cushion were prepared while on the front of it the round projected part were formed and projections for cushion as well, with ventilation holes

punched.

Front part of mid-sole has the space part with the round projected part prepared at the inner side of the outskirt.

The surface of out-sole has vertical and horizontal air inhalation way and air supply way while frontend part of air supply way was connected to the air inhalation room and joint part of the air inhalation way had punched ventilation hole.

Publication No. 90-2537 of utility patent revealed footwear sole providing ventilation and shock absorption which had airing cap fitted to its receptacle. The front part of soft cushion mid-sole has punched holes while the reverse-side of it shock-absorbing projections.

Back part of the reverse side of the cushioned mid-sole had circular projections while back part of the out-sole air-inhalation and exhalation entry. The projected part on the front of the heel was prepared for fitting to the airing cap which has ventilation holes and receptacles.

Further, publication no. 90-2538 of utility patent revealed footwear sole providing ventilation and shock

16800 U.S. PTO
29/203335



absorption which had heel cushioned pad on the surface of out-sole. Soft cushioned pad with surface of cork layer was to be fitted to the inside of the cut-part which was prepared at the front part of hard texon board mid-sole.

The surface of cushioned pad was attached to texon board mid-sole by textile net. The reverseside of cushioned pad had cushioned projections through which ventilation holes lead.

The reverseside of heel cushioned pad having curve part on its surface contained air inhalation room and air-supply way. The inner part of air inhalation room had shock-absorbing projections.

The projected part of air inhalation and exhalation entry that lead to an ventilation room and air-supply way had punched ventilation holes, and airing cap having holeing joints was fitted to the out-sole.

The above-described technology allows good ventilation within footwear as the airing cap has ventilation holes but can not effectively prevent water from getting into the footwear in bad weather.

16800 U.S. PTO
29/203335



041404

16800 U.S. PTO
29/203335



In addition, the shock absorbing material at the heel is not fitted in the inside of the heel of the sole and the effective shock absorption at the heel of the sole can not be expected.

Further, the fact that the cushioned shock absorbing material for the heel is not fitted at texon board can neither afford good shock absorbing effect to the back-side of the foot nor remove the negative factors for the shock absorption in case of the sole of footwear having heel such as that of shoes, military shoes, safety shoes and mountain-climbing shoes due to the hard iron for waist fitted at texon board.

This invention aimed at improving and removing the above-mentioned drawbacks can afford the effective shock absorbing effect to the backside of foot with the mid-sole fitted into the backside of the footwear.

The mid-sole has varied horseshoes-shaped shock-absorbing material with the excellent elasticity (heel of out sole in case of shoes).

The innerside of the shock absorbing material for the heel is hollow but the sectional parts of the both side form the closed pipe types.

The shock absorbing material of pipe type has flange at the upper & lower parts facing outside which can lighten the shock to the backside of foot in walk.

The shock absorbing material at the heel is horseshoes-shaped.

The sectional part of the innerside is closed while the unit sectional part facing outside forms the plural layer of the opened circular arc or hexagonal shape.

The invention ^{may have} / a feature that buoyancy plate fitted at the inner part of waterproof and ventilation portion prevents water from getting into the sole in bad weather by means of its rising due to buoyancy which close inhalation and exhalation entry leading to the sole.

The invention ^{may have} / another feature that subsiding of the buoyancy plate due to exhausting force when the air in the sole is exhausted can exhaust water in waterproof and ventilation part through ventilation entry.

16800 U.S.P.T.O.
29/203335



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Specific embodiments of the invention will now be described, by way of example only, and with reference to the accompanying drawings in which:-

- Figure 1 is a dismantled perspective view of footwear sole with a flat bottom as per sports footwear
- Figure 2 is a dismantled perspective view of footwear sole with a heel such as that of leather shoes, safety shoes, military shoes and mountain-climbing shoes
- Figure 3 is an enlarged sectional view of A-A line of Figure 1
- Figure 4 is an enlarged sectional view of B-B line of Figure 1
- Figure 5 is an enlarged sectional view of C-C line of Figure 1
- Figure 6 is an enlarged sectional view of A-A line of Figure 2
- Figure 7 is an enlarged sectional view of B-B line of Figure 2
- Figure 8 is an enlarged sectional view of C-C line of Figure 2



Figure 9 is an perspective view of the ventilation and water-proofing part ;

(A) Figure is a dismantled perspective view

(B) Figure is a partly-incised perspective view

(C) Figure is an enlarged vertical sectional view

Figure 10 is an enlarged perspective view of cushion portion of the heel

Figure 11 is a perspective view of shock absorbing material of the heel

Figure 12 is an enlarged sectional view of A-A line of Figure 11

Figure 13 is an illustration one of appearance of shock absorbing material applied ;

(A) is a perspective view of appearance of shock absorbing material applied.

(B) is an enlarged figure of outer sectional part

(C) is a perspective view of enlarged portion

(D) is a sectional view of A-A line of (C) part

Figure 14 is an illustration one of appearance of shock absorbing material applied ;

(A) is a perspective view of appearance of shock
absorbing material applied

(B) is an enlarged figure of outer sectional part

(C) is a perspective view of enlarged portion

(D) is a sectional view of A-A line of (C) part

Figure 15 is an illustration one of appearance of shock
absorbing material applied at the heel

(A) is a perspective view of appearance of shock
absorbing material applied

(B) is an enlarged figure of outer sectional part

(C) is a perspective view of enlarged portion

(D) is a sectional view of A-A line of (C) part

Figure 16 to Figure 26 are varied illustration ones and their
sectional views of shock absorbing
material applied at the heel

Code description of major part of a Figure

1 : mid-sole

2, 2" : ventilation room

3 : ventilation hole

4 : outskirt part

| | |
|--------------------------------------|---|
| 5, 5' : round projected part | 6, 6" : reception room |
| 7 : circular arc-shaped | 8, 8' : flange |
| 9 : cushion material for heel | 10 : air way |
| 11, 11' : reception groove | 12 : water-proofing and ventilation entry |
| 13, 13' : flap | 14 : shock absorbing heel material |
| 15, 15' : flange | 16, 16' : air compression room |
| 17 : elliptic wall body | 18 : air entry |
| 19 : ventilation way | 22 : in-sole |
| 23, 23' : cushion airbag | 25 : out-sole |
| 29 : exhaust way | 29' : exhaust hole |
| 30, 30' : air supply way | 30" : air supply hole |
| 31 : waist part | 39 : upper plate |
| 40 : hollow pipe-shaped small bodies | 41 : wall of inhaling and exhausting room |
| 42 : backward wall | 42' : forward wall |
| 43 : ventilation room | 44 : water-incoming room |
| 45 : ventilation entry | 46 : inhalation and exhalation entry |
| 47 : ventilation part | 48 : buoyancy plate |

16800 U.S. PTO
29/203335



041404

16800 U.S.PTO
29/203335



| | |
|---|--------------------------------------|
| 49 : seperation projection | 50 : lower plate |
| 51 : circular flange | 51' : circular arc-shaped projection |
| 52 : inner sectional part | 53 : hollow pipe-shaped bodies |
| 54, 54', 54" : connecting band | 55 : hollow part' |
| 56 : cylinder body | 57, 61 : inner sectional part |
| 58 : incoming part | 59 : hollow part |
| 60 : hexa-angled body | 60' : dual body |
| 62, 62', 62", 62' ", 79 : circular arc shape | |
| 63, 63', 66, 66', 68, 68', 70, 70' : upper and lower bodies | |
| 64 : X-shaped wall | 65 : rod |
| 67, 67', 72 : rods | 69, 69', 71 : half-circled body |
| 73 : supporting body | 74, 74' : ventilation hole |
| 75 : air room | 77 : ball |
| 78 : tube-shaped body | 80 : circular arc part |
| 81 : oval-shaped body | 83 : triangle-shaped body |
| 87 : heart-shaped body | 85 : T-shaped body |
| 88, 88' : round wall | |

16800 U.S. PTO
29/203335



Figure 1 is a view of dismantled footwear sole applied to the sports shoes. The front part surface of the mid-sole (1) has air ventilation room(2) and punched ventilation holes.

There are two circular arc-shaped parts (5)(5') on the the outskirts of the air ventilation room(2). The round receptive room (6) on the rear part surface of the mid-sole (1) and a circular arc-shaped plate is in the round receptive

16800 U.S. PTO
29/203335
041404

room.

The rear cushioned shock absorbing material(9) linked to flange(8)(8') is fitted into the both sectional parts of the arc-shaped plate.

The air way(10) leading to the receptive groove is prepared between the air passage room(2) and the rear cushioned shock absorbing material on the surface of the mid-sole.

The waterproof and ventilation part(12) is fixed to the receptive groove(11) and the horseshoes-shaped back shock absorbing material(14) is fixed between the upper flap and the lower one of the rear part of the mid-sole, constituting a body identical with the mid-sole.

The flanges(15)(15') are formed between the upper part and the lower one of the outskirts of the back shock absorbing material.

On the rear part of the mid-sole the air compression room is prepared by circular wall(17), constituting a body identical with the back shock absorbing material.

The front of the wall(17) has air passage(18).



The passage is linked with the ventilation way (19) which leads through the central part of the mid-sole.

The ventilation way (19) is connected with ventilation holes(3) and air rooms(75) are prepared at the outside of ventilation way(19).

On texon board, the air ventilation room (2') and the round receptive room(6') corresponding to those of the mid-sole(1) are also maintained, forming two circular arc-shaped parts.

The air ventilation room(2") and the round receptive room(6") on the inner sole(22) have the cushioned air bags (23)(23'). The length of its reverse side is prepared so that the lower sectional part of the cushioned air bags (23)(23') may contact the air ventilation room(2) of the mid-sole(1) and the rear cushioned shock absorbing material (7) when texon board (20) and the inner sole(22) is fixed on the surface of the mid-sole(1) and the out-sole (24) is fixed on the reverse side of the mid-sole(1).

The round wall(17) and the air compression room(16')

16800 U.S. PTO
29/203335
041404

may hold a deodorizing agent and a sponge agent(36)(37) containing perfume.

Figure 2 is a view of dismantled footwear sole applied to shoes, military shoes, safety shoes and mountain-climbing shoes having back heel. The front part surface of out-sole (25) has air ventilation room(26) and there are two circular arc-shaped parts(27)(27') on the outskirts(4') of the air ventilation room(26).

The rear part surface of the out sole(25) has ventilation walls(28)(28') as high as the outskirts. The exhaust way(29) is prepared between the ventilation walls(29)(28') while the air supply way outside the ventilation walls (28)(28').

One part of the exhaust way(29) is connected to the exhaust hole(29') while one part of the air supply way(30)(30') to the air supply hole(30'') respectively.

The shank part on the reverseside of the out-sole(25) has the projected waist part(31) playing the role of the iron for waist and the rear heel part(32) has the receptive groove(11').



The waterproof and ventilation part(12) is to be fixed into the receptive groove(11') while the horseshoes-shaped shock absorbing material(14) into between the upper flap and the lower one(13)(13'), constituting a body identical with the heel part(32).

The upper and lower parts of the rear shock absorbing material(14) have flanges(15)(15') and the flat sole(33) is fixed to the reverse side of the heel part(32).

The air ventilation room(26') is also prepared on the texon board(20'), corresponding to that of the out sole (25).

The circular arc-shaped part(27") is projected toward the air ventilation room(26'). The inner sole(22') has the air ventilation room(26") and the receptive room(6") corresponding to those of texon board(20').

The air ventilation room(26") and the receptive room (6") have cushioned air bags(23)(23').

The length of its reverse side is prepared so that the lower sectional part of the cushioned air bags(23)(23') may

16800 U.S.PTO
29/203335



041404

contact bottom of the air ventilation room(26) of the out sole (25) and the surface of texon board(20 ').

In Figure 1, the cushioned air bags(23) in the ventilation room(2) of the mid-sole may displace those in the ventilation room(2 ") of the inner sole.

In Figure 2, the cushioned pad(34) with the cushioned projection(35) and the ventilation holes(74 ") may be prepared optionally in the air ventilation room(26) of the out sole.

The water-proof and ventilation part(12) in Figure 9 constitutes 4 angled box-shaped body with holding joint(38).

On the center of the reverseside of the upper plate(39) small pipe(40) is prepared vertically and the half of this pipe (40) is cut and closed at the back wall(42) of the body by the wall of inhalation and exhalation room(41).

Due to the partition of this wall of inhalation and exhalation room(41) ventilation room(43) and water-incoming room (44) take forms in the water-proof and ventilation part(12).

The water-incoming room is connected to the ventilation entry(45) of the front wall(42 ') and the pipe(40).



The inhalation and exhalation entry(46) of the pipe and the ventilation room(43) is connected to the ventilation part of the rear wall(42).

Under the pipe(40) the bottom of the box-shaped body is closed with the out plate(50) which has separation projections(49) toward upward for buoyancy plate(48).

Figure 13 to Figure 26 is a view showing the varied types available for transformation of shock absorbing heel material.

It is made of saturated resin or rubber with good elasticity. Being a long form, it is transformed to horse-shoes-shaped hoof for being fixed to the mid-sole(1) of sports footwear or the out sole of shoes and the varied sole of footwear.

The shock absorbing heel material(14) of Figure 13 is hollow. The inner sectional part(52) is open while the outer one has the composition which has pipe-shaped bodies with flange and the circular arc-shaped projections(51') linked



by connecting band.

The shock absorbing heel material(14) of Figure 14 has the composition that two lines of the cylinders(56) of hollow part(55) are linked and the inner sectional part(57) is closed while the shortened parts are prepared at the inner part.

The shock absorbing heel material(14) of Figure 15 has the composition that there are the duplicated hexagonal bodies (60 ') of hollow part(59) having one hexagonal body(60) between them(60 ').

The inner sectional part(61) is closed.

The shock absorbing heel material(14) of Figure 16 has the composition that the inner sectional part is partitioned by wall(64) between the upper wall and the lower one(63)(63 ') whose inner sectional part is closed in the circular arc shape.

The internal mandrel is prepared in the wall(64) and the outer sectional part of the upper and lower walls have flanges (15)(15 ').

The shock absorbing heel material of Figure 17 has the composition that the internal mandrels(67)(67 ') are prepared



between the upper wall and the lower one(66)(66') whose inner sectional parts are closed in circular arc-shape(62').

The shock absorbing heel material of Figure 18 has the composition that the half-ringed bodies(69)(69') are prepared between the upper wall and the lower one (68)(68') and the outer sectional part of the upper and lower walls(68)(68') take forms of flanges(15)(15').

The shock absorbing heel material(14) of Figure 19 has the composition that there are the half-ringed bodies(71) and the internal mandrels(72) between the upper wall and the lower one of which the internal sectional part are closed in the shape of circular arc(62) and the lower part of the half-ringed body has a supporting body(73) and further, the external sectional part of the upper and lower walls(70)(70') take forms of flanges(15)(15').

The shock absorbing heel material(14) of Figure 20 has the composition that there are horseshoes-shaped shock absorbing heel material(14) with flanges(15)(15') on the upper and lower part of the external outskirts.



The heel material(14) contains the elastic ball(77) or the pipe(78).

The shock absorbing heel material(14) of Figure 21 has the composition that it is hollow and the internal sectional part is open while the external sectional one taking form of circular flange(15) has pipes(81) containing circular arc-shaped part(80) which are connected with linking band(54'').

The shock absorbing heel material(14) of Figure 22 has the composition that the internal sectional part of the hollow upper and lower walls is closed in the type of circular arc(82) and the inside of the hollow part has triangled bodies in the form of upright position and upside-down one, constituting horseshoes shape.

The shock absorbing heel material(14) of Figure 23 has the composition that the internal sectional part of the upper and lower walls is closed and the external hollow part contains the upright and upside-down T-shaped bodies, constituting the horseshoes shape.

The shock absorbing heel material(14) of Figure 24 has the



(composition that the internal sectional part of the hollow upper and lower walls is closed in the shape of circular arc (86) and the external hollow part contains the upright and upside-down Heart-shaped bodies, constituting the horseshoes shape.

The shock absorbing heel material(14) of Figure 25 has the composition that the internal sectional part of the upper and lower walls is closed in the shape of circular arc and the elastic alphabet-shaped bodies are between the upper wall and the lower one.

The shock absorbing heel material(14) of Figure 26 has the composition that the internal sectional part of the upper and lower walls is closed in the shape of circular arc and the elastic Olympic marks and the figures(91) of sportsmen are between the upper wall and the lower one.

Code no. 74 and 74 ' are ventilation holes punched on the sheet of the cushioned air bag and Code no. 76 and 76 ' are supporting parts for the forming groove of mold which is used when the shock absorbing heel material(14) is fixed to the heel



part of the mid-sole(1).

The processing steps of the invention are as follows :

In Figure 1, the shock absorbing heel material(14), first of all, is to be fixed between the upper flap and the lower one (13)(13') of the mid-sole(1) and the water proof and ventilation part(12) to be fixed in the reception groove.

The ventilation part(47) applied at the rear wall(42) of the water proof and ventilation part(12) is to be connected to the air way(10).

As the ventilation entry(45) punched on the front wall (42") of the water proof and ventilation part(12) faces the outside of the mid-sole, the air from the outside can be induced into the ventilation entry(45).

The air is to get through the ventilation room(43) by means of the inhalation and exhalation entry(46) and to pass the air way(10) by the ventilation part(47). The air gets into the ventilation hole(3) at the air ventilation room(2) and then reach the air compression room(16) through the ventilation way (19) existing at the reverse side of the mid-sole(1).



The satisfactory air-inhalation stated above can be made when the out-sole(24) is fixed to the reverse side of the mid-sole(1) with the cushioned shock absorbing material(9) fixed on the surface of the mid-sole so as to have the middle of the reception room(6) take the circular arc shape and texon board (20) is also fixed with the inner sole(22) fixed on the surface of texon board.

The process of the air-exhalation is undergone vice versa.

In case of sports shoes as well as boots, military shoes and safety shoes etc., it is desirable that the footwear sole has a device affording the possible shock absorbing means to the heel as back part of the foot receives much shock in walk and exercise taking.

So, the shock absorbing heel material(14) that is horse-shoes-shaped with the upper and lower flanges(15)(15') is fixed at the back part of the footwear sole in this invention and on the material the circular arc-shaped(7) cushioned shock absorbing material(9) is fixed with flanges(8)(8') getting into the reception room and further, at the reverse side of it the air compression room(16) is formed with wall(17).



Due to the composition as described above, the hollow shock absorbing heel material(14), in walk, is contracted and with the upper and lower flanges(15)(15') receiving load, the air in the air compression room(16) moves toward the front part due to the contraction of the wall(17).

By means of the course stated above, the heel part of the sole can absorb the shock ideally and the shock transmitted to the back part of foot is so little that the fatigue feeling due to the shock from footwear can be dissolved.

The cushioned airbags(23)(23') can be fitted to the inner-sole(22) as well and the air compression in the cushioned airbag(23)(23') can not only absorb the shock but give the elastic effect by means of the elasticity of the cushioned airbag.

The shock to the sole of a foot can be alleviated by means of the air room(75).

In the water-proof and ventilation part(12) the buoyancy plate(48) is to be put on the separation projection(49) and does not cause any trouble in terms of air ventilation in good



weather while in bad weather the water-permeating through the ventilation entry of the front wall(42') remain on the out-plate(50) of the water-proof and ventilation part(12) and the buoyancy plate(48) is buoyant and rises.

The buoyancy plate(48) risen closes the lower part of the inhalation and exhalation entry(46), which makes water-proofing possible as water in the water-incoming room(44) of the water-proof and ventilation part(12) can not get into the inhalation exhalation entry.

On the other hand water in the water-incoming room(44) lower the buoyancy plate(48) with the air in the sole of footwear exhaled.

Accordingly, with the air full of the upper part of the water-incoming room(44) compresses, water in the room(44) is exhaled through the ventilation entry(45) to give the effective water-proofing.

In Figure 2 as well as is Figure 1, the horseshoes-shaped shock absorbing heel material(14) is to be fixed between the upper flap and the lower one(13)(13') of the heel part of the



out-sole(25) and the water-proof and ventilation part(12) to be fixed in the reception groove of heel part on the reverse side of the out-sole.

With the front wall(42') facing the front of the footwear sole and the rear wall(42) the opposite part of it, the ventilation part(47) the ventilation hole(29') and the exhaust way(29) are to be connected to the air ventilation room(26) while the air compression room on the reverse side of the out-sole(25), air supply hole(30") and the air supply ways(30)(30') to the air ventilation room(26) separately.

In landing, the air in the air compression room(16') that is compressed due to the contraction of the shock absorbing heel material(14) of the heel part(32) get into the air ventilation room(26) through the air supply hole(30") and the air supply ways(30)(30').

Then, the air in the air ventilation room(26) compressed by the sole of foot pass the exhaust way(29) and the ventilation hole(29') and is exhausted through the inner ventilation part(47) and the external ventilation entry(45) of the



water-proof and ventilation part(12).

With the cushioned airbag(23) and the shock absorbing heel material restored the external air is induced into the inside of the footwear vice versa.

The effect from the function of the ventilation entry(12) and the cushioned airbags(23)(23') and the shock absorbing heel material(14) of the inner sole is same as that in case of sportsshoes of Figure 1.

Especially, the waist part fitted on the out-sole of the footwear having rear heel as in case of boots, military shoes, safety shoes and mountain-climbing shoes can remove the factors of problem to shock absorbing due to fitting the steel in texon board.

In addition, the waist part(31) can exercise the function of steel usually fitted at waist portion.

The composition of the shock absorbing heel material(14) effective for shock absorption are stated hereunder: the composition that the elastic hollow pipes(53) linked with the connecting band (54) are fixed to heel part of the footwear sole, the composition that a hexagoned body(60) is between the duplicated hexagoned bodies(60') of hollow part(59).



the composition that the inner sectional part is partitioned by wall(64) between the upper wall and the lower one(63)(63') whose inner sectional part is closed in the circular arc shape.

The internal mandrel is prepared in the wall(64) and the outer sectional part of the upper and lower walls have flanges (15)(15').

the composition that the internal mandrels(67)(67') are prepared between the upper wall and the lower one(66)(66') whose inner sectional parts are closed in circular arc-shaped(62'),

the composition that the half-ringed bodies(69)(69') are prepared between the upper wall and the lower one(68)(68') and the outer sectional part of the upper and lower walls(68)(68') take forms of flanges(15)(15').

the composition that there are half-ringed bodies(71) and the internal mandrels(72) between the upper wall and the lower one of which the internal sectional part are closed in the type of circular arc(62'') and the lower part of the half-ringed body has a supporting body(73) and further, the external sectional part of the upper and lower walls(70)(70') take forms of flanges(15)(15').



(the composition in the horseshoes-shaped shock absorbing heel material contains the elastic ball(77) or the pipe(78),

the composition that the internal sectional part of the hollow upper and lower walls is closed in the type of circular arc(82) and the inside of the hollow part has triangled bodies in the form of upright position and upside-down one, constituting horse-shoes shape.

the composition that the internal sectional part of the upper and lower walls is closed and the external hollow part contains the upright and upside-down T-shaped bodies, constituting the horseshoes shape.

the composition that the internal sectional part of the hollow upper and lower walls is closed in the shape of circular arc (86) and external hollow part contains the upright and upside-down Heart-shaped bodies, constituting the horseshoes shape.

the composition that the internal sectional part of the upper and lower walls is closed in the shape of circular arc and the elastic alphabet-shaped bodies are between the upper wall and the lower one.

the composition that the internal sectional part of the upper

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(and lower walls is closed in the shape of circular arc and the elastic Olympic marks and the figures(91) of sportsmen are between the upper wall and the lower one.



CLAIMS

1. A footwear sole providing ventilation, shock absorption and fashion in a shoe having a flat bottom surface, said sole comprising:

a mid-sole with a front part surface having air ventilation room and punched ventilation holes, two arc-shaped parts projecting inwardly on the outskirts of the air ventilation room (2), round reception room (6) on the rear part surface of the mid-sole (1) and an arc-shaped plate in the round reception room;

rear cushioned shock absorbing material (9) linked to flange (8)(8') and fitted into the both sectional parts of the arc-shaped plate;

an air way (10) leading to a reception groove (11) disposed between the air passage room (2) and the rear cushioned shock absorbing material (9) on the surface of the mid-sole;

a water proof and ventilation part (12) fixed in the reception groove (11);

a horseshoe-shaped back shock absorbing material (14) fixed between an upper flap and a lower one in the rear part of the mid-sole which are integral with the mid-sole;

on a rear part of the mid-sole an air compression room is formed by a circular wall (17), constituting a



body integral with the back shock absorbing material;

a elliptical wall (17) having a front air passage (18) linked with a ventilation way (19) which leads through a central part of the mid-sole, the ventilation way (19) being connected with ventilation holes (9) and air rooms (75) are formed outside of ventilation way (19), the elliptical wall (17) and the air compression room (16') may hold a deodorizing agent and a sponge agent (36)(37) containing perfume;

the air ventilation room (2'') and the round reception room (6'') on the inner sole (22) having cushioned air bags (23)(23').

2. A footwear sole in accordance with Claim 1 utilized in a shoe having a heel, the reception groove (11') being formed at a heel part on reverse side of an out-sole (25), the groove being designed for a water proof and ventilation part (12) to be fitted there into, the sole further comprising a shank part on the front side having a projected waist part (31), an exhaust hole (29') and air supply hole (30'') being formed in an air compression room (16') and the reception groove (11'') so as to be connected to the exhaust way (29) and the air supply ways (30)(30') on the heel part of the sole (25) surface.



3.. A shoe sole as in Claim 1 wherein the horseshoe-shaped shock absorbing heel material (14) is installed at the rear part of the mid-sole (1).

4. A shoe sole as in Claim 1 wherein the horseshoe-shaped shock absorbing heel material (14) is installed at the rear part of the out-sole (25).

5. A shoe sole as in Claim 1, characterized in that with the water-proof and ventilation part (12) fixed into the inner side of the reception groove (11) prepared between the air ventilation room (2) of the mid-sole (1) and the ball-shaped receptive room (6), the ventilation part (47) of the water-proof and ventilation part (12) is connected to the air passage (10) and the ventilation part (45) of the water-proof and the ventilation part (12) is installed so as to face the external part of the mid-sole (1).

6. A shoe sole as in Claim 2, characterized in that the water-proof and the ventilation part (12) fixed at the reception groove (11') prepared on the rear heel part of the reverse side of the out-sole (25) and with the ventilation entry (45) of the water-proof and ventilation part facing the front direction, the ventilation part (47) is to face the rear direction, connected to the exhaust hole (29').



7.. A shoe sole as in Claim 2, characterized in that the projected waist part (31) is installed on the shank of the out-sole (25).

8. A shoe sole as in Claim 2, characterized in that the reception room (6) of the heel part of the mid-sole has the cushioned shock absorbing rear material (9) with flanges (8) (8') at the both sectional parts, the material (9) whose center is circular arc-shaped being connected to the air compression room (16).

9. A shoe sole as in Claim 1, characterized in that not only the air compression room (16) is formed by means of the round wall (17) on the heel part of the reverse side of the mid-sole (1) but the air inhalation and exhalation entry on the front part of the round wall (17) that is connected to the ventilation way (19).

10. A shoe sole as in Claim 2, characterized in that the air ventilation room (2'') and the reception room (6'') of the inner sole (22) have the punched cushioned airbags (23) (23').

11. A shoe sole as in Claim 1, characterized in that small pipe (40) is prepared vertically on the center of the reverse side of the upper plate (39) and the half of this pipe



(40) is cut and closed at the back wall (42) of the body by the wall of inhalation and exhalation room (41), due to the partition of this wall of inhalation and exhalation room (41) ventilation room (43) and water-incoming room (44) take forms in the water-proof and ventilation part (12), the water-incoming room being connected to the ventilation entry (45) of the front wall (42') and the pipe (40).

12. A shoe sole as in Claim 1, characterized in that both sectional parts of the horseshoes-shaped shock absorbing heel material are closed and the inside of it is hollow with the external upper and lower parts having the projected flanges (15)(15').

13. A shoe sole as in Claim 1, characterized in that the inner sectional part is open while the outer one has composition which has pipe-shaped bodies with flange and the circular arc-shaped projections (51') linked by connecting band.

14. A shoe sole as in Claim 1, characterized in that two lines of the cylinders (56) of hollow part (55) are linked and the inner sectional part (57) is closed while the shortened parts are prepared at the inner part.



15. A shoe sole as in Claim 1, characterized in that there are the duplicated hexagonal bodies (60') of hollow part (59) having one hexagonal body (60) between them (60') and the inner sectional part (61) is closed.

16. A shoe sole as in Claim 1, characterized in that the inner sectional part is partitioned by wall (64) between the upper wall and the lower one (63)(63') whose inner sectional part is closed in the circular arc shape, the internal mandrel being prepared in the wall (64) and the outer sectional part of the upper and lower walls have flanges (15)(15').

17. A shoe sole as in Claim 1, characterized in that the internal mandrels (67)(67') are prepared between the upper wall and the lower one (66)(66') whose inner sectional parts are closed in circular arc-shape (62').

18. A shoe sole as in Claim 1, characterized in that the half-ringed bodies (69)(69') are prepared between the upper wall and the lower one (68)(68') and the outer sectional part of the upper and lower walls (68)(68') take forms of flanges (15)(15').

19. A shoe sole as in Claim 1, characterized in that there are the half-ringed bodies (71) and the internal mandrels



((72) between the upper wall and the lower one of which the internal sectional part are closed in the shape of circular arc (62''') and the lower part of the half-ringed body has a supporting body (73) and further, the external sectional part of the upper and lower walls (70)(70') take forms of flanges (15)(15').

20. A shoe sole as in Claim 1, characterized in that there are horseshoes-shaped shock absorbing heel material (14) with flanges (15)(15') on the upper and lower part of the external outskirts. The heel material (14) contains the elastic ball (77).

21. A shoe sole as in Claim 1, characterized in that it is hollow, and the internal sectional part is open while the external sectional one taking form of circular flange (15) has pipes (81) containing circular arc-shaped part (80) which are connected with linking band (54'').

22. A shoe sole as in Claim 1, characterized in that the internal sectional part of the hollow upper and lower walls is closed and the inside of the hollow part has triangled bodies in the form of upright position and upside-down one, constituting horseshoes shape.



23. A shoe sole as in Claim 1, characterized in that the internal sectional part of the upper and lower walls is closed and the external hollow part contains the upright and upside-down T-shaped bodies, constituting the horseshoes shape.

24. A shoe sole as in Claim 1, characterized in that the internal sectional part of the hollow upper and lower walls is closed in the shape of circular arc (86) and the external hollow part contains the upright and upside-down Heart-shaped bodies, constituting the horseshoe shape.

25. A shoe sole as in Claim 1, characterized in that there are horseshoes-shaped shock absorbing heel material (14) with flange (15)(15') on the upper and lower part of the external outskirts, the heel material (14) containing the elastic pipe-shaped bodies (78).

26. A shoe sole as in Claim 1, characterized in that the internal sectional part of the upper and lower walls is closed in the shape of circular arc and the elastic alphabet-shaped bodies are between the upper wall and the lower one.

27. A shoe sole as in Claim 1, characterized in that the internal sectional part of the upper and lower walls is closed in the shape of circular arc and the elastic Olympic

marks and the figures (91) of sportsmen are between the upper wall and the lower one.

28. A shoe sole as in Claim 1, characterized in that the sponge bodies (36) (37) containing deodorizing material and perfume are put in the wall (17) and the air compression room (16).

29. A shoe sole as in Claim 1, characterized in that the cushioned pad with the cushion projections (35) and ventilation hole (74'') is installed in the air compression room (26) of the out-sole (25).

30. A shoe sole as in Claim 1, characterized in that the cushioned airbag (23) is installed in the air ventilation room (2).

31. A shoe sole as in Claim 1, characterized in that the several air rooms (75) are installed along the boundary on the reverse side of the mid-sole.

32. A sole substantially as hereinbefore described with reference to the drawings.

33. A sole substantially as hereinbefore described and as shown in figures 1, 3, 4 and 5 or figures 2, 6, 7 and 8 of the drawings.

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